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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/025,907	12/26/2001	Yun-Ho Jung	8733.565.00	7489
30827	7590	11/14/2003	EXAMINER	
MCKENNA LONG & ALDRIDGE LLP			PADGETT, MARIANNE L	
1900 K STREET, NW			ART UNIT	
WASHINGTON, DC 20006			PAPER NUMBER	
			1762	

DATE MAILED: 11/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10,625,707

Applicant(s)

Yun-Ho Jung

Examiner

M.L. Padgett

Group Art Unit

1762

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- ☐ Responsive to communication(s) filed on 2/5/03 & 12/26/01
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 1 1; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 1-14 is/are pending in the application.
- Of the above claim(s) 1-4 is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 5-14 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement

Application Papers

- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- ☒ All ☐ Some* ☐ None of the:
 - ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

*Certified copies not received: _____

Attachment(s)

- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). (2/5/03) ☐ Interview Summary, PTO-413
- ☒ Notice of Reference(s) Cited, PTO-892 ☐ Notice of Informal Patent Application, PTO-152
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948 ☐ Other _____

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1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-4, drawn to an apparatus for laser scanning using a mask, classified in class 118 or 219, subclass 641 or 121.6⁺, respectively.
 - II. Claims 5-14, drawn to a method of crystallizing amorphous Si with a laser via sequential lateral solidification, classified in class 427 or 117, subclass 554 or 8, respectively.
2. The inventions are distinct, each from the other because:
3. Inventions group II and group I are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(c)). In this case the apparatus may be used to irradiate surfaces to be either recrystallized, turned amorphous or patterned, and are other than α -Si.
4. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

5. During a telephone conversation with Song K. Jung on 9/25/03 & 9/26/03 a provisional election was made without traverse to prosecute the invention of group II, method, claims 5-14. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1-4 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

It was noted that the call for a restriction was made previously, but the application has since been scanned, and the non-mailed/oral restriction papers, were not scanned/apparently lost (i.e. not returned to the examiner), hence the examiner no longer had any record of the previous conversation.

6. Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 5, line 7 "minute" can be considered ambiguous, as it could be referring to relative size of movements or to timing of movement. Also, if the former, it is defined by the first moving step in line 15, which would tend favor choice of that meaning. Exactly what scope is encompassed by "sequential lateral solidification" (SLS) is unclear. At the top of page 3 of the specification, it states a SLS, "which includes growth of silicon grains to form single-crystal silicon film using laser energy, is proposed", however this is not a definition but a possible outcome, hence does SLS require the results by single crystalline by definition, or is it only a possibility. Since the claims never state what the resulting crystalline morphology is, clarification on the record with a concise prior art definition (or one in the specification), or explicit recitation in the claims is desirable.

Claims 13 potentially contradicts, line 10 of claim 11, hence is unclear.

7. It is noted that claim 10 require a capability for the apparatus used in claim 5, where that capability is never positively employed, i.e. may be considered optional. This is just an observation on the scope of the claims as written. In claims 7 and 13, "distance[d] is equal to or less than the length of the lateral grain growth" [l], would appear to require $d \leq l$, so that each successive move of the mask must overlap crystallized growth areas.

8. Claim 13 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in

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independent form. Claim 11, line 10 requires the mask be moved to a portion that has not been crystallized, so in dependant claim 13 claiming that overlap of areas of growth, i.e. "less than...", appears to not be further limiting due to contradiction of the previous requirement.

9. Related applications by the inventor, Yun-Ho Jung are noted to include 10/151,880; 10/157,201; 10/196,415; 10/163,419 and 10/157,199, which have related method claims for laser SLS crystallization processes of α -Si. As found in the published applications, (880) and (201) appear to be the closest to the present claims, but have details of mask configuration, not required by the present claims.

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 5-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Im (6,368,954 B1).

Note that the patent to Im, incorporates by reference all of both SN 09/390,537, now PN. 6,573,531 (col.3, lines 58-67); and SN09/390,535 now P.N. 6,555,449 (Col.4, lines 50-Col.5, line 2⁺), hence the (954) patent encompass the disclosures of all 3 references.

In Im, see the abstract for laser treating α -Si films with beamlets; Fig. 1A described on Col.4, lines 1-17⁺, noting positioning of laser/lens 148/marketing system 150/lens 162/substrate 170/translation stage 180 are as claimed. Flow chart of Fig.8, described on col. 10, line 27-col. 11, line 27 follows the sequence of applicants' claims in that the continuous incremental melting/crystallization using "beamlets" to complete "columns" (ref#1050), corresponds to the claimed portions forming blocks, with completing subsequent "columns" by repeating techniques after repositioning corresponds to "another block." Im illustrates sample masks in Fig. 2A - 4A & 6A, with the resultant SLS crystallization patterns illustrated

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beside them (B), discussed col. 4, line 65-col.5, line 15. While the flow chart states that the sample is translated for the various motions (#1040,1045,1055 and 1066), col. 4, lines 14-17 and 39-57*, clearly indicate that sample translation with respect to the laser may be by moving either the masking system 150 or the sample stage 180, hence translations corresponding to ref# 1055 of the flow chart, are clearly suggested to be preformed via moving the mask. The actual values for distances the mask is translated in such a case is not given, however col. 4, line 16 and col. 11, lines 20-27, esp. line 23, refer to micro translations (in the Y-directions), and Col. 5, lines 20-37 discusses division of a sample in to columns, then subdividing those, where irradiated portions may be made to overlap, by for example 1 μm , which would have been suggestive to one of ordinary skill of several micrometer mask translation given typical beam dimension, configuration, etc.


Note while the lenses in the illustrated optics of Fig. 1A, are not discussed in detail, their shapes are suggestive of their function, which would appear to be condensing, same as claimed.

12. Other art on SLS that teaches multiple mask slits for laser beam and movable mask teachings equivalent to Im above, include Vooutsas (6,573,163 B2 and 2003/0064551 A1); and Yang who has other laser induced α -Si crystallization teachings of interest.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M L. Padgett whose telephone number is 703-308-2336 or after mid December (571) 272-1425. The examiner can normally be reached on Monday-Friday from about 8:30 am to 4:30 pm. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

M. Padgett/lap 10/31/03
November 6, 2003


MARIANNE PADGETT
PRIMARY EXAMINER